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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BUSHEY, CHARLES S

ART UNIT PAPER NUMBER

1724

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/743,531

Applicant(s)

OHNARI, HIROFUMI

Examiner

Scott Bushey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4 and 6-10 is/are pending in the application.
4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 2-4 and 8-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 2, 3(2 or 10), 4(2 or 10), 9 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Specifically, independent claims 2, 9 and 10 have been amended by applicant to include the phrases “by direct impingement”, “directly impinging”, or “directly impinges” relative to the interaction between the liquid and gas streams within the claimed device, which does not find support in the originally filed application papers. Supporting the Examiner’s holding of new matter with respect to the abovementioned phrases added to the claims, is applicant’s own remarks set forth on pages 8 and 9 of the remarks portion of the amendment filed March 15, 2004, wherein applicant states repeatedly how the addition of the phrases in question clearly change the scope of the claims and have been entered in an express attempt to overcome the prior art rejection based upon Fontein et al.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2, 8, and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fontein et al (Figs. 1, 4a and 4b; col. 1, lines 31-36; col. 7, lines 1-19).

Applicant should note that the language added to the claims that has been held to be new matter above has not been given patentable weight herein with respect to the claims as now recited. However, even if such language (by direct impingement or directly impinging) were given full weight and consideration, the applied prior art reference would still be considered to anticipate the claims rejected herein, since the gas and liquid phases of the reference clearly enter a device having the same structure as the claimed invention, the phases passing through the device in the same manner as in the claimed invention. Furthermore, in view of the fact that the reference clearly teaches a relatively small mixture outlet opening relative to the enlarged interior space of the device adjacent the tangential liquid inlet means, one having ordinary skill in the art would recognize that the spinning central gas stream would be forcibly cut off and smashed by the spinning peripheral liquid stream, which must also exit the device with the gas through the small mixture outlet opening.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3(2 or 10), 4(2 or 10), 8, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontein et al.

Fontein et al (Figs. 1, 2, 4a and 4b; col. 1, lines 31-36; col. 3, lines 10-16, 38-41, 49-57, 72-75; col. 4, lines 12-15; col. 7, lines 1-19, 59-72) as has been applied above substantially disclose applicant's invention as recited by instant claims 3(2 or 10), 4(2 or 10), 8, 9, and 10, except for the plural liquid inlets and their respective placement within the gas-liquid contacting apparatus as disclosed by Figures 1 and 2 of the reference. Fontein et al (Figs. 4a and 4b) do however envisage the use of multiple, tangential pressure liquid inlet streams placed along the circumferential wall of the contact space to improve contact between the phases. It would have been obvious for an artisan at the time of the invention, to provide either of the devices of Figures 1 or 2 of the reference with plural, tangential liquid inlets along the circumferential wall of the contact space to improve contact between the phases, in view of the teachings envisaged within the same reference. With respect to the placement of the tangential liquid inlets adjacent to or near the gas-liquid mixture outlet, applicant should note that Figure 2 of the reference specifically teaches such. Furthermore, although the reference is largely silent as to the dynamic mechanism through which contact between the phases occurs within the disclosed device, the fact that the applied reference teaches an apparatus that anticipates applicant's apparatus would suggest to one having ordinary skill in the art that the method of contact between the phases, as recited by instant claims 8 and 9, would have been obvious to one having ordinary skill in the art at the time of the invention. Specifically, as stated above, in view of the fact that the reference clearly teaches a relatively small mixture outlet opening relative to the enlarged interior space of the device adjacent the tangential liquid inlet means, one having ordinary skill in the art would recognize that the spinning central gas stream would be forcibly cut off and smashed by the

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spinning peripheral liquid stream, which must also exit the device with the gas through the small mixture outlet opening.

Response to Arguments

7. Applicant's arguments with respect to claims 3(10), 4(10) and 10 have been considered but are moot in view of the new grounds of rejection.

8. Applicant's arguments filed September 28, 2004 pertaining to claims 2, 3(2), 4(2), 8, and 9 have been fully considered but they are not persuasive.

With respect to the argument drawn to the new matter rejection pertaining to the "direct impingement" of the swirling gas stream by the swirling pressurized liquid stream, such is not persuasive, since the originally filed application papers do not disclose such "direct impingement", nor do the originally filed drawing figures suggest such. Applicant's statement on page 8 of the amendment filed September 28, 2004, that "liquid from liquid inlet 20 directly impinges on space 10", is not relevant to the issue at hand, since the claims are directed to direct impingement of the swirling gas stream (which only fills a small central portion of the space 10) by the swirling liquid stream, not the direct impingement of the space 10 by the swirling liquid stream. In fact, the depictions by Figures 1(a), 1(b), and Figure 3 (which illustrates the elected species of the invention), indicate that the tangential liquid stream, at its point of entry into the interior space of the device would be spaced substantially radially away from the swirling gas stream, and thus any contact between the streams would have to occur at a point at which the velocity and thus the centrifugal forces acting upon the swirling liquid stream would be reduced such that the peripherally rotating liquid stream would move inward toward the centrally spinning gas stream.

With respect to the art rejections of the instant claims over Fontein et al, applicant's arguments are predicated upon the belief that the reference cannot anticipate or render obvious applicant's claimed invention, since the reference discloses either an inlet gas pipe (8) or an outlet nozzle (9a) that lies between the liquid inlet means and the central region of the interior space of the contact device. Such is not at all persuasive since the instant claims do not preclude such a structure. Furthermore, Fontein et al clearly teach "finely dispersing a gas in a liquid" at col. 1, lines 32-33. Lastly, as explained in the rejection statements above, in view of the fact that the reference clearly teaches a relatively small mixture outlet opening relative to the enlarged interior space of the device adjacent the tangential liquid inlet means, one having ordinary skill in the art would recognize that the spinning central gas stream would be forcibly cut off and smashed by the spinning peripheral liquid stream, which must also exit the device with the gas through the small mixture outlet opening.

Conclusion

9. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bushey whose telephone number is (571) 272-1153. The examiner can normally be reached on Monday-Thursday 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Scott Bushey
Primary Examiner
Art Unit 1724


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